

2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
1	Option D is correct	A French horn produces only sound energy.
	Option A is incorrect	Fireworks produce both sound energy and light energy.
	Option B is incorrect	A television produces both sound energy and light energy.
	Option C is incorrect	A digital alarm clock produces both sound energy and light energy.
2	Option G is correct	The sediments on top of the dead plants and animals contribute to the compression of the dead plants and animals to form coal, a fossil fuel.
	Option F is incorrect	The dead plants and animals are buried under sediments, so they are not available for scavengers.
	Option H is incorrect	The dead plants and animals were not washed away by water but were buried under layers of sediment.
	Option J is incorrect	An aquifer is underground, porous, and made of permeable rock that contains and transfers water.
3	Option A is correct	Information in the chart shows that the bony fish has more control over how it can swim.
	Option B is incorrect	There is no information in the chart that describes the depth to which a fish can sink because of bones in its tail.
	Option C is incorrect	There is no information in the chart that describes how much energy is used by either fish when swimming.
	Option D is incorrect	There is no information in the chart that describes whether the tail fin aids in camouflage.
4	Option G is correct	The diagrams show different amounts of water dripping from pots with different types of sediment.
	Option F is incorrect	All of the pots have water added to the sediments, so there is no comparison between wet and dry soils.
	Option H is incorrect	The same amount of water (100 mL) was added to each pot.
	Option J is incorrect	The time that is measured is how long it takes the water to begin dripping from the pot, not how long it takes the soil to dry.
5	Option C is correct	Metals are conductors of both thermal energy and electricity.
	Option A is incorrect	Not all metals are solids, and many nonmetals are less dense than water.
	Option B is incorrect	Few metals float on water.
	Option D is incorrect	Metals conduct, not insulate, thermal energy.
6	Option F is correct	Bacteria and a horse are both living organisms.
	Option G is incorrect	Ivy plants are living organisms, but the fence is nonliving.
	Option H is incorrect	A hard, rocky surface is nonliving.
	Option J is incorrect	Carbon dioxide is nonliving.
7	Option A is correct	Both the motion and the position of the ball are being changed.
	Option B is incorrect	The motion of the ball is changed.
	Option C is incorrect	The racquet is not being pulled.
	Option D is incorrect	Work is being done.
8	Option J is correct	Energy is transferred in the direction of the arrows, from producers to consumers.
	Option F is incorrect	The order of the energy transfer is reversed.
	Option G is incorrect	Energy is not transferred from hawks to frogs.
	Option H is incorrect	Energy is not transferred from grasshoppers to crickets.
9	Option B is correct	In order to measure the liquid water produced from 10L of snow, the snow must first melt.
	Option A is incorrect	If the snow is kept in the freezer, the state of matter will not change.
	Option C is incorrect	Melting the snow depends on temperature, not location.
	Option D is incorrect	The snow must melt in order to measure the amount of liquid water it contained.

2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
10	Option H is correct	The location of a specific bird feeder is learned.
	Option F is incorrect	A cardinal does not learn to have red feathers.
	Option G is incorrect	A cardinal does not learn to eat seeds only during the day.
	Option J is incorrect	Making sounds is an innate behavior.
11	Option D is correct	Wood is an alternative resource that was likely used by early humans.
	Option A is incorrect	Coal is a fossil fuel, not an alternative resource.
	Option B is incorrect	Natural gas is a fossil fuel, not an alternative resource.
	Option C is incorrect	Petroleum is a fossil fuel, not an alternative resource.
12	Option G is correct	The refraction of light is what causes the tongs to appear broken.
	Option F is incorrect	Light can be refracted and separated into different colors; however, this does not describe the change in the appearance of the tongs.
	Option H is incorrect	Light travels in a straight line and can be reflected off of the surface of the water; however, this does not describe the change in the appearance of the tongs.
	Option J is incorrect	Light can be absorbed and reflected; however, this does not explain the change in the appearance of the tongs.
13	Option D is correct	The characteristics listed describe a valley formed by the movement of a glacier.
	Option A is incorrect	Valleys formed by earthquakes would not have the same characteristics as valleys formed by the movement of glaciers.
	Option B is incorrect	Volcanic activity builds up Earth's crust, and this valley was created by erosion.
	Option C is incorrect	A river would create a V-shaped valley, not valleys with round floors.
14	Option G is correct	The stages of the life cycle of the frog most closely match the stages of the life cycle of the abalone.
	Option F is incorrect	Humans do not have a larval stage.
	Option H is incorrect	Birds do not have a larval stage.
	Option J is incorrect	Snakes do not have a larval stage.
15	Option A is correct	LEDs 1, 3, and 4 are not affected by the position of the switch.
	Option B is incorrect	The switch position affects LED 2.
	Option C is incorrect	LED 1 will also produce light with the switch open.
	Option D is incorrect	The switch position affects LED 5.
16	Option J is correct	The oil, safety pin, sugar cube, and rubber ball match the descriptions in the table.
	Option F is incorrect	Pancake syrup is a liquid.
	Option G is incorrect	A sugar cube is soluble in water.
	Option H is incorrect	An iron needle is attracted to a magnet.
17	Option C is correct	Based on the diagram, a grasshopper undergoes incomplete metamorphosis, and a ladybird beetle undergoes a complete metamorphosis.
	Option A is incorrect	Based on the diagram, there is no way to determine the length of time for either the ladybird beetle or the grasshopper to develop into an adult.
	Option B is incorrect	Based on the diagram, there is no way to determine the habitat of either the grasshopper or the ladybird beetle during any developmental stage.
	Option D is incorrect	Based on the diagram, there is no way to determine the stages of development for either the ladybird beetle or the grasshopper.

2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
18	Option F is correct	Running water forming a stream through soil best represents the process that formed the Grand Canyon because the Grand Canyon was formed by erosion from running water.
	Option G is incorrect	A fan blowing air over sand represents the formation of a sand dune.
	Option H is incorrect	A marble dropping into a bucket of mud represents an impact from a meteorite.
	Option J is incorrect	A hammer and chisel breaking apart a rock represents weathering of rock.
19	Option D is correct	Using multiple trials while controlling all variables except one produces more reliable results in experiments.
	Option A is incorrect	Different scales could measure differently and would result in more than one uncontrolled variable in the experiment.
	Option B is incorrect	Each side of the block has a different surface area and would result in more than one uncontrolled variable in the experiment.
	Option C is incorrect	Blocks would not slide the same way on different tables and would result in more than one uncontrolled variable in the experiment.
20	Option G is correct	The broad shape of the lily helps the leaf float on the surface, and the slim mesquite leaves help prevent water loss.
	Option F is incorrect	The lily grows in water and so does not need to trap rainwater to survive.
	Option H is incorrect	The lily makes its own food and so does not need to attract fish to survive.
	Option J is incorrect	The lily does not need to attract aquatic birds to survive.
21	Option A is correct	The sun appears to move across the sky from east to west and will be moving below the western horizon in a few hours.
	Option B is incorrect	Student 2 stated that the sun would reach the eastern horizon too quickly, and student 4 stated that the sun was near its noontime position.
	Option C is incorrect	Student 2 explained that the sun would reach the eastern horizon too quickly.
	Option D is incorrect	Student 3 stated that the sun would appear in the west in early morning.
22	Option J is correct	Flower color is an inherited trait.
	Option F is incorrect	Flower color is not determined by the air temperature.
	Option G is incorrect	Flower color is not determined by the age of the plant.
	Option H is incorrect	Flower color is not determined by the types of animals that eat them.
23	Option B is correct	The melting ice will increase the mass and volume of the solution and decrease the temperature.
	Option A is incorrect	A salt-water solution is colorless, and once the ice melts, the color and state of the solution will be unchanged.
	Option C is incorrect	The melting ice cubes do not change the mass of the salt in the solution.
	Option D is incorrect	Once the ice melts, the state of the solution is not changed.
24	Option F is correct	The light travels in straight lines, and when it reaches the mirror, the light will be reflected.
	Option G is incorrect	The light reaching the mirror will not move toward the ceiling because of refraction.
	Option H is incorrect	Light that enters the mirror is reflected, not refracted by the back of the mirror.
	Option J is incorrect	Once light reaches the mirror, it is reflected.
25	Option C is correct	Plants use carbon dioxide to make sugar, which is used by animals for food.
	Option A is incorrect	Fish do not use carbon dioxide for energy.
	Option B is incorrect	Fish cannot make their own food.
	Option D is incorrect	Plants release oxygen, not carbon dioxide.

2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
26	Option J is correct	Placing a metal pot of water over glowing charcoal in an outdoor grill would produce enough thermal energy to heat the water.
	Option F is incorrect	Electricity is required for the microwave oven to work.
	Option G is incorrect	Shaking a bottle would not produce enough thermal energy to boil water.
	Option H is incorrect	A flashlight would not produce enough thermal energy to boil water.
27	Option C is correct	The water oaks are producers, and the web shows arrows pointing from the water oaks to mice, ants, squirrels, and skunks.
	Option A is incorrect	The web shows arrows pointing from the water oaks to four organisms, not two.
	Option B is incorrect	The web shows arrows pointing from the water oaks to four organisms, not three.
	Option D is incorrect	The web shows arrows pointing from the water oaks to four organisms, not five.
28	Option F is correct	The sun warms the ocean water, which causes evaporation, and the water vapor condenses to form a cloud.
	Option G is incorrect	The sun's heat does not cause clouds to gather.
	Option H is incorrect	The sun's light does not cause water to condense.
	Option J is incorrect	Water is not reflected; however, light is reflected.
29	Option C is correct	Adding water will increase the volume of one of the liquids, identifying it as water.
	Option A is incorrect	The layer with the greatest density will be on the bottom, and water may not be the layer with the greatest density.
	Option B is incorrect	Ice is less dense than water and will float on top of the water layer.
	Option D is incorrect	Some liquids have a lower freezing point than water and may take longer to freeze.
30	Option F is correct	The graph shows that most of the leaves had smooth edges, which indicates that the plants grew in a hot climate.
	Option G is incorrect	The graph shows equal numbers of smooth and jagged leaf edges, which doesn't indicate a hot or cold climate.
	Option H is incorrect	The graph shows that most of the leaves had jagged edges, indicating that they grew in a cold climate.
	Option J is incorrect	The graph shows that almost all the leaves had jagged edges, indicating that they grew in a cold climate.
31	Option D is correct	The circuit will be complete when the two wires are connected.
	Option A is incorrect	The circuit is not complete when the switch is open.
	Option B is incorrect	The circuit is not complete when the switch is open.
	Option C is incorrect	The circuit is not complete. Electricity will not flow through the wood block.
32	Option F is correct	The floating leaves would allow the plants to absorb sunlight to make food.
	Option G is incorrect	The roots are located at the bottom of the plant and anchor it.
	Option H is incorrect	Structures that help plants make food do not help them avoid predators.
	Option J is incorrect	Plants do not capture fish to make food.
33	Option C is correct	Water is warmed by flowing past hot underground rock or soil layers and then pumped back to the house.
	Option A is incorrect	Biofuels produce energy by burning once-living matter, such as plants.
	Option B is incorrect	Hydroelectric energy is produced by falling water, usually water over a dam.
	Option D is incorrect	Solar energy is produced by the sun's rays striking an object above the ground.
34	Option J is correct	Animals that eat fish or have webbed feet live in areas with lakes and rivers.
	Option F is incorrect	Animals that live in dry mountains do not eat fish or need webbed feet.
	Option G is incorrect	Animals that live in pine forests do not eat fish or need webbed feet.
	Option H is incorrect	Animals that live in deserts do not need thick fur or webbed feet.

2018 STAAR Grade 5 Science Rationales

Item #	Rationales	
35	Option B is correct	Gravel does not dissolve in water, and its particles are too large to go through the strainer.
	Option A is incorrect	Salt dissolves in water, so the strainer will not separate them.
	Option C is incorrect	Shampoo dissolves in water, so the strainer will not separate them.
	Option D is incorrect	Sugar dissolves in water, so the strainer will not separate them.
36	Option F is correct	Weathering is the breakdown of rocks, and erosion is the process which carries away the sediments.
	Option G is incorrect	Sediments are deposited after being eroded and transported.
	Option H is incorrect	Weathering and erosion do not usually determine the amount of water in the river.
	Option J is incorrect	Weathering and erosion of sediments occur before transport, deposition, and compaction.